WHAT IS CLAIMED IS

1. An isolated nucleic acid comprising a member selected from the group consisting of:

(a) a polynucleotide which encodes a polypeptide of SEQ ID NO: 2, 8, 10, 12, 14, 16, 18, 20, or 22;

(b) a polynucleotide amplified from a plant nucleic acid library using the primers of SEQ ID NOS: 3 and 4, 5 and 6, 9 and 10, or 11 and 12 or primers determined by using Vector nti Suite, InforMax Version 5.

(c) a polynucleotide comprising at least 20 contiguous bases of SEQ ID NO: 1, 7, 9, 11, 13, 15, 17, 19, or 21;

(d) a polynucleotide having a plant HAP3-type ccaat-box transcriptional activator, wherein the polynucleotide is from a plant other than *Arabidopsis*;

(e) a polynucleotide having at least 60% sequence identity to SEQ ID NO: 1, 9, 11, 13, 17, or 21 or 65% sequence identity to SEQ ID NO: 15 or 19 or 70% sequence identity to SEQ ID NO: 7, wherein the % sequence identity is based on the entire sequence and is determined by GAP analysis using Gap Weight of 50 and Length Weight of 3;

(f) a polynucleotide comprising at least 25 nucleotides in length which hybridizes under high stringency conditions to a polynucleotide having the sequence set forth in SEQ ID NO: 1, 7, 9, 11, 13, 15, 17, 19, or 21;

(g) a polynucleotide containing a conserved region coding the polypeptide of SEQ ID NO: 23, wherein the polynucleotide is from a plant other than *Arabidopsis*;

(h) a polynucleotide having the sequence set forth in SEQ ID NO: 1, 7, 9, 11, 13, 15, 17, 19, or 21; and

(i) a polynucleotide complementary to a polynucleotide of (a) through (h).

2. The isolated nucleic acid of claim 1, wherein the transcriptional activator in (d) is from corn, soybean, wheat, rice, *Veronia*, or *Argemone*.

3. The isolated nucleic acid of claim 1 wherein the polynucleotide in (f) is a functional equivalent.

4. A vector comprising at least one nucleic acid of claim 1.

5. An expression cassette comprising at least one nucleic acid of claim 1 operably linked to a promoter, wherein the nucleic acid is in sense or antisense orientation.

6. The expression cassette of claim 5, wherein the nucleic acid is operably linked in antisense orientation to the promoter.

7. A host cell containing at least one expression cassette of claim 5.

8. The host cell of claim 7 that is a plant cell.

9. A transgenic plant comprising at least one expression cassette of claim 5.

10. The transgenic plant of claim 9, wherein the plant is corn, soybean, sorghum, wheat, rice, alfalfa, sunflower, canola or cotton.

11. A seed from the transgenic plant of claim 9.

12. The seed from the transgenic plant of claim 10.

13. An isolated protein comprising a member selected from the group consisting of:

(a) a polypeptide comprising at least 25 contiguous amino acids of SEQ ID NO: 2, 8, 10, 12, 14, 16, 18, 20, or 22;

(b) a polypeptide which is a LEC1 transcriptional activator containing the conserved motifs of SEQ ID NO: 23, wherein the polypeptide is from a plant other than *Arabidopsis*;

(c) a polypeptide comprising at least 60% sequence identity to SEQ ID NO: 2, 12, 14, 16, 20, or 22 or 70 % sequence identity to SEQ ID NO: 8, 10, or 18, wherein the % sequence identity is based on the entire sequence and is determined by GAP analysis using Gap Weight of 12 and Length Weight of 4;

(d) a polypeptide encoded by a nucleic acid of claim 1;

(e) a polypeptide encoded by a nucleic acid of SEQ ID NO: 1, 7, 9, 11, 13, 15, 17, 19, or 21; and

(f) a polypeptide having the sequence set forth in SEQ ID NO: 2, 8, 10, 12, 14, 16, 18, 20, or 22.

14. The protein of claim 13, wherein the transcriptional activator of (b) is a LEC1 protein from corn, soybeans, wheat, rice, *Veronia*, or *Argemone*.

15. A ribonucleic acid sequence encoding a protein of claim 13.

16. A method for modulating LEC1 activity in a plant, comprising:

(a) transforming a plant cell with at least one expression cassette of claim 5 and

(b) regenerating a transformed plant that expresses the at least one nucleic acid in an amount sufficient to modulate LEC1 activity in the plant.

17. The method of claim 16, wherein the plant is corn, soybean, sorghum, wheat, rice, alfalfa, sunflower, canola or cotton.

18. The method of claim 16, wherein LEC1 activity is increased.

19. The method of claim 16, wherein LEC1 activity is decreased.

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20. A method for transiently modulating the level of LEC1 activity in plant cells comprising introducing at least one nucleic acid of claim 1.

21. The method of claim 20 wherein the at least one nucleic acid is a ribonucleic acid.

22. A method for transiently modulating the level of LEC1 activity in plant cells comprising introducing at least one polypeptide of claim 13.

23. A method for enhancing tissue culture response in a plant cell comprising introducing into the plant cell at least one LEC1 polypeptide or at least one LEC1 polynucleotide under conditions sufficient to enhance tissue culture response.

24. The method of claim 23 wherein the plant cell is transformed with at least one LEC1 polynucleotide.

25. The method of claim 23 wherein at least one polynucleotide is operably linked to a promoter driving expression in the plant cell and growing the plant cell.

26. The method of claim 23 wherein the plant cell is a recalcitrant cell.

37CFR 1.126 27~~28~~. The method of claim 26 wherein the plant cell is an inbred plant cell.

28~~29~~. A method for inducing somatic embryogenesis in a plant cell comprising introducing into a responsive plant cell at least one LEC1 polypeptide or at least one LEC1 polynucleotide, wherein the responsive plant cell is transformed and grown under conditions sufficient to stimulate the production of a transformed embryo and wherein the plant cell is other than an *Arabidopsis* cell.

29 30. The method of claim 28 wherein the plant cell is transformed with at least one LEC1 polynucleotide.

30 31. The method of claim 29 wherein at least one polynucleotide is operably linked to a promoter driving expression in the plant cell.

Sub A9 > 31 32. The method of claim 28 further comprising growing the transformed embryo under plant growing conditions to produce a regenerated plant.

32 33. The method of claim 28 wherein the plant cell is from corn, soybean, sorghum, wheat, rice, alfalfa, sunflower, canola or cotton.

33 34. A plant produced by the method of claim 28.

34 35. A method for positive selection of a transformed cell comprising introducing into a responsive plant cell at least one LEC1 polynucleotide or at least one LEC1 polypeptide and growing the transformed plant cell, wherein the responsive plant cell is transformed and grown under conditions sufficient to induce embryogenesis to provide a positive selection means.

35 36. The method of claim 34 wherein the plant cell is transformed with at least one polynucleotide.

36 37. The method of claim 35 wherein at least one polynucleotide is operably linked to a promoter driving expression in a plant.

37 38. The method of claim 34 further comprising altering media components to favor the growth of transformed plant cells.

38 39. The method of claim 34 wherein the media components are altered to reduce somatic embryogenesis in non-transformed cells.

39 40. The method of claim 36 wherein the polynucleotide is excised.

41. The method of claim 40 wherein the polynucleotide is flanked by FRT sequences to allow FLP mediated excision of the polynucleotide.

42. A method for inducing apomixis in a plant cell comprising introducing into a responsive plant cell at least one LEC1 polypeptide or at least one LEC1 polynucleotide and growing the plant cell, wherein the introducing and growing is done under conditions sufficient to produce a transformed somatic embryo.

43. The method of claim 42 wherein the plant cell is transformed with at least one LEC1 polynucleotide.

44. The method of claim 43 wherein the at least one polynucleotide is operably linked to a promoter driving expression in a plant cell

45. The method of claim 42 further comprising suppressing in the plant cell the expression of an FIE polycomb polynucleotide using sense or antisense methods .

46. The method of claim 42 further comprising growing the embryo under plant growing conditions to produce a regenerated plant.

47. The method of claim 43 wherein the promoter is an inducible promoter.

48. The method of claim 43 wherein the at least one polynucleotide is expressed in integument or nucellus tissue.

49. A plant produced by the method of claim 42.

50. The plant of claim 49, wherein the plant is male sterile.

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51. A method for increasing transformation efficiency comprising introducing at least one LEC1 polypeptide or at least one LEC1 polynucleotide into a responsive plant cell under conditions sufficient to increase transformation efficiency.

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52. The method of claim 51 wherein the transformation is conducted in medium that retards growth of somatic embryo growth in non-transformed plants.

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53. The method of claim 52 wherein transformation is conducted with reduced levels of auxin or no auxin.

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54. The method of claim 51 wherein the plant cell is transformed with at least one LEC1 polynucleotide.

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55. The method of claim 54 wherein the at least one polynucleotide is operably linked to a promoter driving expression in a plant cell

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56. The method of claim 51 wherein the plant cell is a recalcitrant cell.

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57. The method of claim 56 wherein the plant cell is an inbred cell.

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58. A method for increasing recovery of regenerated plants comprising introducing into a responsive plant cell at least one LEC1 polypeptide or at least one LEC1 polynucleotide and growing the plant cell, wherein the introducing and growing are under conditions sufficient to produce a regenerated plant.

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59. The method of claim 58 wherein the plant cell is transformed with at least one LEC1 polynucleotide.

59 58
60. The method of claim 59 wherein the at least one polynucleotide is operably linked to a promoter driving expression in a plant cell

61. The method of claim 58 wherein the plant cell is a recalcitrant cell.

62. The method of claim 61 wherein the plant cell is an inbred plant cell.